

## CLAIMS

In the Claims:

1. An electrocoagulation treatment device for treatment of a flow of liquid comprising:

a housing having an upper portion and a lower portion, said upper portion defining a development chamber and said lower portion defining a reaction chamber;

5 an inlet communicating with said housing at said reaction chamber to allow the flow of liquid into said housing;

a secondary separation chamber integral with said housing and placed adjacent said upper portion thereof;

10 an outlet communicating with said secondary separation chamber to allow the flow of liquid out of said housing;

20 a plurality of reaction plates disposed in said housing and extending substantially vertical within said reaction chamber, said plurality of reaction plates being spaced apart from one another creating gaps extending continuously between adjacent reaction plates, said flow of liquid being in a flow direction upward through said gaps between said plurality of reaction plates, said reaction plates being consumed over time due to electrocoagulation;

at least two reaction plate tabs integral with selected ones of said plurality of reaction plates, said reaction plate tabs having ends which are isolated from the flow of liquid in said housing; and

20 a source of power providing line voltage to said tabs in order to create an electrical field for the electrocoagulation treatment within said reaction chamber.

2. A device, as claimed in claim 1, wherein:

said development chamber is further defined as an open area above said reaction chamber within said housing.

3. A device, as claimed in claim 1, further including:

a wier positioned in said housing and interconnecting said secondary separation chamber and said development chamber.

4. A device, as claimed in claim 1, further including:

a top cover placed over said housing.

5. A device, as claimed in claim 1, wherein:

said at least two reaction plate tabs include tab extensions which extend through the lower portion of the housing.

6. A device, as claimed in claim 1, further including:

a vacuum tube extending through said secondary separation chamber, said vacuum tube connected to a source of vacuum for evacuating contaminants within said housing.

7. A device, as claimed in claim 1, further including:

an air inlet attached to said housing at said lower portion thereof to introduce air within said liquid stream resulting in increased turbulence.

8. A device, as claimed in claim 1, wherein:

said housing further includes a pair of opposing ledges formed in said lower portion thereof, said pair of ledges for supporting lower edges of said plurality of reaction plates.

9. A device, as claimed in claim 1, further including:

a riser tube communicating with said outlet and said riser tube extending upwards from a lower surface of said secondary separation chamber.

10. A device, as claimed in claim 1, further including:

at least two reaction plate tab housing extensions extending from the lower portion of said housing, wherein said at least two reaction plate tabs are received in said extensions.

11. An electrocoagulation treatment device for treatment of a flow of liquid comprising:

a housing including an upper portion and a lower portion, said upper portion defining a development chamber and said lower portion defining a reaction chamber;

an inlet communicating with said housing at said lower portion to allow the flow of liquid into said housing;

a secondary separation chamber integral with said housing and extending adjacent therefrom;

a plurality of reaction plates disposed in said housing and extending substantially

vertically therein, said plurality of reaction plates being spaced apart from one another creating

gaps extending continuously between adjacent reaction plates, said flow of liquid being in a flow direction upward through said gaps between said plurality of reaction plates, said reaction plates being consumed over time due to electrocoagulation;

a source of power communicating with said reaction plates, said source of power  
15 providing voltage to said reaction plates in order to create an electrical field for electrocoagulation treatment within said reaction chamber;

means for interconnecting said plurality of reaction plates to said source of power, said means for interconnecting extending through said lower portion of said housing; and

an outlet communicating with said secondary separation chamber to allow the flow of  
20 liquid out of said housing.

12. A device, as claimed in claim 11, wherein:  
said development chamber is further defined as an open area above said reaction chamber within said housing.

13. A device, as claimed in claim 11, further including:  
a wier integral with said housing and interconnecting said secondary separation chamber and said development chamber.

14. A device, as claimed in claim 11, further including:  
a top cover placed over said housing.

15. A device, as claimed in claim 11, wherein:

said at least two reaction plate tabs include tab extensions which extend through the lower portion of the housing.

16. A device, as claimed in claim 11, further including:

a vacuum tube extending through said secondary separation chamber, said vacuum tube connected to a source of vacuum for evacuating contaminants within said housing.

17. A device, as claimed in claim 11, further including:

an air inlet attached to said housing at said lower portion to introduce air within said liquid stream thereby increasing turbulence.

18. A device, as claimed in claim 11, wherein:

said housing further includes a pair of opposing ledges formed in said lower portion thereof, said pair of ledges for supporting lower edges of said plurality of reaction plates.

19. A device, as claimed in claim 11, further including:

a riser tube communicating with said outlet and said riser tube extending upwards from a lower surface of said secondary separation chamber.

20. A device, as claimed in claim 1, further including:

at least two reaction plate tab housing extensions extending from the lower portion of said housing, wherein said means for interconnecting are received in said extensions.

21. A method of electrocoagulation treatment of a liquid, said method comprising the steps of:

providing a housing including a lower portion defining a reaction chamber, an upper portion defining a development chamber, and an adjacent portion defining a secondary separation chamber;

arranging a plurality of reaction plates within said reaction chamber, the plates being vertically disposed therein and spaced apart from one another creating gaps between adjacent reaction plates, said reaction plates being consumed over time due to electrocoagulation taking place within said reaction chamber;

providing at least a pair of reaction plate tabs connected to selected ones of the plurality of reaction plates, the reaction plate tabs extending through the lower portion of the housing, and the reaction plate tabs being connected to a source of power;

applying a line voltage to the at least a pair of reaction plate tabs to create an electric field within the reaction chamber;

passing a liquid stream vertically through the reaction chamber in the gaps between reaction plates;

further passing the liquid stream through the development chamber and into the secondary separation chamber; and

conducting electrocoagulation of the liquid stream to cause the reaction plates to give up

20 ions whereby the reaction plates are consumed over time.

22. A method, as claimed in claim 21, further including the step of:

adjusting the voltage and amperage between the reaction plates by changing the electrical connection between selected ones of the at least a pair of reaction plate tabs.

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